

Idaho Currents

State Faces Fifth Year of Low Water

As Idaho enters its fifth consecutive year of drought, water managers are concerned about how much water will be available for all the different needs throughout the state.

As of May 1, the healthy snow packs that were near average in early and mid-winter dropped to well below average, according to the Natural Resources Conservation Service (NRCS). Stream flow forecasts mirrored the declining snow and decreased each month.

In fact, stream flow forecasts remain the lowest in the Bear River basin at 4 percent of average and are 20-50 percent in central Idaho. The highest are 70 percent of average for a few streams in northern Idaho.

In some basins, such as the Boise and upper Snake, stream flow will be less than the past two years,

but better than in 2001. However, the Big Lost Basin may experience the lowest surface water supplies since the drought started four years ago unless conditions improve.

This is not good news for Idaho's numerous water users who were hoping this year's encouraging snowfall would put a dent in the cumulative four-year drought. The drought will continue in parts of Idaho and may be the driest year yet.

Moderate above normal mountainous temperatures in March and April gradually melted the snowpack, allowing snow measuring sites to lose a tenth to half an inch of snow water a day. These rates were slow enough to allow the melt water to infiltrate into the ground.

Snowpack

The remaining snowpack is the lowest at 25-35 percent of average in the lower elevation basins of Weiser, Mann, Rathdrum, Little Lost, Portneuf and Owyhee. The highest snow packs are 73 percent of average in Priest and North Fork Clearwater basins.

Elsewhere, snow packs are 40-60 percent of average. The snow pack is about half of last year's in west central and central Idaho, and about three-quarters of last year in eastern Idaho.



This May 6 photo at Lower Granite Dam shows there isn't enough water to run the generators and also send water through the spillway gates. (Photo by Gerald Fleischman)

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Reservoirs

Reservoir storage is the highest along the western side of Idaho. Brownlee, Boise, Payette, and Dworshak reservoirs are all reporting above average storage. In contrast, Bear Lake remains nearly empty in terms of useable storage water at 23 percent of average. However, the lake still contains more than 5 million acre-feet of water that is not useable storage.

Nine other reservoirs are below average, including Blackfoot Reservoir at 24 percent of average, the lowest April 30 storage since 1935. Salmon Falls,

start exceeding inflows. Drafting of reservoirs will occur earlier than normal and many reservoirs will again be at their minimum storage levels later this summer.

Surface Water Supply Index

Idaho's Surface Water Supply Index (SWSI) shows how severe and low the water supplies will be this year. Five basins (Salmon, Big Lost, Little Lost, Snake above Heise, and Bear) are at or below a value of -3.4. A value of -3.9 is the driest for any of these basins since 1971.

The SWSI is a predictive indicator of surface water availability within a watershed for the spring and summer water use season. The index is calculated by combining pre-runoff reservoir storage (carryover) with forecasts of spring and summer stream flow. SWSI values are scaled from +4.1 (abundant supply) to -4.1 (extremely dry), with a value of zero indicating a median water supply as compared to historical occurrences.

SWSI values are published January through May and provide a more comprehensive outlook of water availability than either stream flow forecasts or reservoir storage figures alone. The SWSI index allows comparison of water availability between basins for drought or flood severity analysis. Threshold SWSI values have been established for most basins to indicate the potential for agricultural water shortages.



This close-up photo of Lower Granite Dam shows water coming out of the generators. (Photo by Gerald Fleischman)

Oakley, Wildhorse, Jackson Lake and Magic reservoirs are storing half their average amounts.

Owyhee and Mackay reservoir are about 70 percent of average, while Palisades Reservoir is 82 percent full. Henrys, Island Park, Grassy and Montpelier reservoirs are 85-90 percent of average.

Some of these percentages sound encouraging, but with snow packs that are about half of average in the high country and streams forecast well below average or near record low, reservoir releases will soon

Idaho SWSI Updates

Previously, Idaho's Surface Water Supply Index was only updated during the planning season from January through May. Starting this year, the index will be updated the beginning of each month throughout the summer to enable users to monitor drought conditions.

The monthly values will be posted on the Idaho NRCS Snow Survey Water Supply web page under "Drought and Surface Water Supply Index" at www.id.nrcs.usda.gov/snow/watersupply/swsi-main.html. Numerous graphs are available to users to access and visualize the wet and dry cycles for their basins of interest.



Governor Declares Drought Emergencies in 14 Counties

Fourteen counties in Idaho have been declared drought emergencies as of May 28, the most recent being Oneida County in southeastern Idaho.

Gov. Dirk Kempthorne had declared 10 of the emergencies, while Acting Governor Jim Risch added four counties – Bannock, Bonneville, Madison and Power – to the list on May 20.

Gooding County is also experiencing drought conditions. The Milner Gooding Canal and the Northside Canal have less than normal supplies for irrigators and the Snake River water supply is estimated to be the third lowest in more than 30 years.

Since 2000, Custer County has experienced continued drought conditions in the Salmon and Big Lost River basins. This year stream flow volume in the Salmon River portions of the county is only 64 percent of average, while the Big Lost basin's stream flow is estimated to be close to the record low set for the drainage in 1992.

Lemhi County has also suffered from continued drought since 2000. This year, both the Salmon and

Lemhi rivers are estimated to be flowing at 64 percent of average in the county.

To be declared a drought emergency, each county's commissioners submit a declaration request to the Idaho Department of Water Resources for approval. The director then submits the request to the governor.

Under the declaration, irrigators in the county can work with the IDWR to secure temporary water rights and make modifications to existing water rights. Drought emergency declarations are effective until Dec. 31, unless extended or terminated by IDWR Director Karl Dreher.

In addition to Oneida, the governor's office has approved drought emergency declarations for Bannock, Bonneville, Madison, Power, Blaine, Butte, Caribou, Clark, Custer, Fremont, Gooding, Lemhi, and Lincoln counties. Last year, drought declarations were approved in 19 Idaho counties.

All drought emergency declarations are available on the department's website at www.idwr.state.id.us.



In Blaine County, the stream flow for the Big Wood River is 39 percent of normal. Magic Reservoir (pictured on May 21) has less than half the water needed for irrigation, resulting in four consecutive years of early irrigation termination. (Photo by Stuart Van Greuningen)

Living Green

Idaho Energy Consultant Creates His Own Green Home in Boise

Ken Baker has long admired the virtues of energy and resource efficiency. Now he's living it – or, rather, living in it.

The Idaho energy consultant and his family recently moved into their new 2,250-square-foot home that sets on 5.2 acres in the Boise foothills. Baker designed it as a green residence, using the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) commercial standards as a guideline for green decisions.

It features energy-saving measures that combine to beat Idaho's residential energy code by nearly 30 percent, along with environmentally friendly building materials, natural landscaping and erosion controls.

Baker, who served as his own general contractor, figures his incremental cost for building green at slightly more than \$2,000, mainly for energy features. He estimates a total house cost of \$87 per square foot, less than the \$95-\$110 per-square-foot common for local custom homes.

Baker brought to this project a long background in building and energy efficiency, and a desire to put ideas into his own built environment. "These are things I've ... been thinking about since 1977," says Baker. "This was an opportunity for me to see how much of this whole green design I could implement into my building."

He highly recommends a green home – for such benefits as comfort, durability, resource efficiencies and good quality indoor air. He also suggests that people considering building green should work with knowledgeable and experienced professionals.

Going green

Baker approached his family's new green home with extensive relevant experience. He earned a master's degree in architecture, designed and built energy-efficient homes in the 1980s, and served many years with the Idaho Department of Water Resources Energy Division. His current consulting work includes



Ken Baker pauses on his porch steps as he looks at the view of Boise and Meridian from his home north of Hill Road. (Photo by Diane Holt)

energy efficiency education and planning, and energy code training and coordination.

For his home, Baker relied largely on LEED commercial criteria; LEED residential standards are under development, but not yet available. "I used the LEED 2.1 as a guideline to question my green decisions on the house," he says.

LEED's rating system for new commercial buildings covers six categories, totaling 69 possible points. Energy and atmosphere account for the highest percentage of potential points, 17; followed by indoor environmental quality, 15; sustainable sites, 14; materials and resources, 13; water efficiency, 5; and innovation and design, 5. Baker said he used the first five of those six categories.

The energy efficiency features were easier to obtain than the green materials, which proved more challenging. Recycled carpet was readily and locally available, at \$28 per square yard. Paints with no volatile organic compounds also were easily acquired, but not linoleum.

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Baker liked the components of linseed oil and cork products, but discovered this linoleum came from Germany, adding substantially to embodied energy. Vinyl became his flooring choice for two bathrooms and a utility room.

He also wanted to find local slate for some flooring, but learned that tile is more environmentally benign. For hardwood flooring sections Baker went with American-grown maple, which is non-local, but also isn't imported from overseas. The maple flooring sports a water-based finish, as an indoor air quality benefit. The exterior cedar siding comes from Idaho.

Outside the home

Baker is nurturing what he calls "a fairly natural habitat," with rabbitbrush, sagebrush and other native plants, such as grasses and wildflowers. "Most of the site is just naturalized," he says. That saved him \$2,000 for sod.



A perimeter drain empties into the bark chips away from the house. The drain will minimize runoff and erosion around the house. (Photo by Diane Holt)

Baker also crafted an erosion and sedimentation control plan, as required by LEED and for Boise city developments in the foothills and/or on parcels larger than 1 acre. During construction, as one example, driveway rocks kept vehicles from tracking mud off the property.

A perimeter drain encircles the entire house, to collect water. This site work cost Baker \$650 and delayed construction more than two months, which added \$7,000 to the project cost. But, he notes, "There is a real reason for doing this" as a green building practice – to minimize runoff and erosion.

Asked about advice for others contemplating a green home, Baker says, "The first thing I'd say is, 'do it. You're going to find it worth doing,'" for such benefits as better indoor air, more comfort, longer-lasting materials and energy bill savings. He also counsels people to "talk to someone who's knowledgeable, who's done this before."

Baker also thinks green is relative. "As much as I have done to make it green, I'm still not satisfied that it is," he says. "I still think we have a long way to go to truly make our houses green. And we haven't even begun to talk about the size of the house itself."

He acknowledged that when he sees a small dwelling, "I actually get a warm feeling in my stomach: 'That's more like it.'"

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The yard surrounding the Baker home combines mostly native plants, such as sagebrush, with some grass and bark chips for a more naturalized setting. (Photo by Diane Holt)

Energy-Efficient Home Should Minimize Heating, Cooling Systems

As an energy consultant with a master's degree in architecture, Ken Baker has been thinking about building his own energy-efficient home with environmentally friendly building materials.

Baker's new home in the Boise foothills reflects his attention to limiting power use. The home exceeds Idaho's residential energy efficiency standard – the 2000 International Energy Conservation Code – by 29 percent.

"The envelope (insulation and windows) meets the new regional Energy Star Standards, although Baker chose a lower efficiency air conditioner than the required 13 Seasonal Energy Efficiency Ratio (SEER)," says Ken Eklund, principal energy specialist with the Energy Division.

Energy-saving measures added about \$2,000 to the home's cost. Insulation accounts for most of that incremental cost. Baker opted for R-21 insulation for exterior walls (code is R-17), R-44 for ceilings (R-38 is required) and R-30 under floors (R-19 is minimum).

He says he thought about – but eventually decided against – spending an additional \$2,000 for an inch of rigid foam on the home's exterior, which would have brought the home to 39 percent above code requirements.

Low-emissivity windows in the Baker home rate from 0.31 to 0.35 U-values, well below code standards of 0.45. They allow plenty of daylight inside but limit solar heat gain. These windows came at no cost premium.

"We were able to do a lot with windows and insulation," Baker says. The gas-fired furnace is rated at a high 92-percent efficiency, with a 10 SEER for cooling. Hard ducts (not flexed) are sealed tight with mastic.

The home also sports a central air conditioner with 2 tons capacity – down from 5 tons recommended by an HVAC contractor. But Baker expects the AC won't turn on very often.

"My house is designed to be passively cooled," he explained. In addition to the insulation and window features, transom windows on the second floor can be opened to help warm air escape at night. Boise's average summertime high and low temperatures vary by 35 degrees, he noted.

Baker contemplated evaporative cooling, but chose the softer path for cooling. Passive solar heating offered another option, but that requires a thermal mass inside, and he wanted a more open floor plan. He anticipates annual heating bills of \$200 and very little for cooling.

Estimated simple payback for the heating/cooling elements is two to five years, primarily for insulation and the gas furnace. Also on the energy side, the home sports Energy Star-qualified appliances, along with compact fluorescent lamps, although he couldn't put dedicated CFL fixtures everywhere.



The Baker home is passively cooled with high R-value insulation in the ceiling, walls, and floor and low-emissive windows. (Inset) Transom windows on the second floor help warm air escape. (Photos by Diane Holt)